REMARKS

I. Introduction

In response to the pending Office Action, Applicants have amended claims 51, 52, 55 and 56 in order to further clarify the subject matter of the present invention. Support for the amendments to claims 51, 52, 55 and 56 may be found, for example, in Fig. 1 of the drawings. No new matter has been added.

An RCE is being filed concurrently with this Amendment.

For the reasons set forth below, Applicants respectfully submit that all pending claims are patentable over the cited prior art references.

II. Rejection Of Claims 2, 3, 5 and 51 Under 35 U.S.C. § 102

Claims 2, 3, 5 and 51 were rejected under 35 U.S.C. § 102(a) as being anticipated by Onojima et al. (*Appl. Phys. Lett.*, **2003,** 83(25), 5208-10). Applicants respectfully submit that Onojima fails to anticipate the pending claims for at least the following reasons.

With regard to the present invention, amended claim 51 recites a semiconductor device comprising a first III-V Nitride semiconductor epitaxial film having 4H-polytype structure formed in contact with a substrate having 4H-type structure, wherein said first III-V Nitride semiconductor epitaxial film is a 4H-AlN film, and a second III-V Nitride semiconductor epitaxial film having 4H-polytype structure formed on said first III-V Nitride semiconductor epitaxial film, wherein said second III-V Nitride semiconductor epitaxial film contains Ga.

One feature of the semiconductor device of claim 51 is that it includes two layers of 4H-semiconductor films formed on the substrate, the second of which contains Ga and is formed on

the 4H-AlN semiconductor film which contacts the substrate. One feature of this semiconductor device is that it is possible to obtain a hetero-junction device exhibiting superior characteristics in terms of higher speed and power operations of electronic devices.

In contrast to the present invention, Onojima fails to disclose two layers of 4H-semiconductor films formed on a substrate. Onojima discloses only a 4H-AlN semiconductor film formed on a SiC substrate (see, Onojima p. 5210, lines 13-16). Furthermore, Onojima is silent with regard to use of a film having a 4H-polytype structure for constructing a semiconductor device and with regard to constructing a device using a 4H-III group Nitride semiconductor film containing Ga. Accordingly, Onojima fails to anticipate claim 51 of the present invention.

Anticipation under 35 U.S.C. § 102 requires that each and every element of the claim be disclosed, either expressly or inherently in a prior art reference, *Akzo N.V. v. U.S. Int'l Trade Commission* , 808 F.2d 1471 (Fed. Cir. 1986), and Onojima does not disclose that a first and second III-V Nitride semiconductor epitaxial film having 4H-polytype structure wherein the second III-V Nitride semiconductor epitaxial film contains Ga. Therefore, as it is apparent from the foregoing that Onojima fails to anticipate claim 51 or any dependent claims thereon, the Applicants respectfully request that the § 102 rejection be traversed.

III. The Rejection of Claims 52-57 Under 35 U.S.C. § 103

Claims 52-57 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Inoguchi et al. (USP No. 5,900,647) in view of Onojima. Applicants respectfully traverse the pending rejections for at least the following reasons.

With regard to the present invention, amended claim 52 recites an optoelectronic device comprising, a first III-V Nitride semiconductor epitaxial film having 4H-polytype structure formed in contact with a substrate having 4-H type structure; a second III-V Nitride semiconductor epitaxial film having 4H-polytype structure formed on said first III-V Nitride semiconductor epitaxial film; and a waveguide formed on said second III-V Nitride semiconductor epitaxial film, wherein said first III-V Nitride semiconductor film is a 4H-AlN film, said second III-V Nitride semiconductor epitaxial film contains Ga, and said second III-V Nitride semiconductor epitaxial film includes an n-type layer, a p-type layer and an active layer, said active layer being formed between said n-type layer and said p-type layer.

As recited in the argument above, Onojima fails to disclose two layers of 4H-semiconductor films formed on a substrate, use of a film having a 4H-polytype structure for constructing a semiconductor device and a device using a 4H-III group Nitride semiconductor film containing Ga. Nor is Inoguchi relied upon to remedy this deficiency. Although Inoguchi teaches the formation of a Ga layer formed on a SiC growth layer, it too fails to disclose two layers, or that the Ga layer is formed on a first III-V Nitride semiconductor epitaxial film. As such, neither Inoguchi nor Onojima teach a semiconductor device having a first and second II-V Nitride semiconductor epitaxial film having 4H-polytype structure wherein the second III-V Nitride semiconductor epitaxial film contains Ga. Accordingly, Inoguchi and Onojima fail to disclose all of the limitations of claim 52 of the present invention.

In order to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 USPQ 580 (CCPA1974). As Inoguchi and Onojima, at a minimum, fail to disclose or suggest a semiconductor device having a first III-V Nitride semiconductor epitaxial film having 4H-

polytype structure formed in contact with a substrate having 4-H type structure; a second III-V Nitride semiconductor epitaxial film having 4H-polytype structure formed on said first III-V Nitride semiconductor epitaxial film wherein the second III-V Nitride semiconductor epitaxial film contains Ga, it is clear that Inoguchi and Onojima, alone or in combination, fail to render amended claim 52 obvious. As such, Applicants respectfully request that the § 103 rejection of amended claim 52, and all pending dependent claims thereon, be withdrawn.

IV. All Dependent Claims Are Allowable Because The Independent Claim From Which They Depend Is Allowable

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claims 51 and 52 are patentable for the reasons set forth above, it is respectfully submitted that all pending dependent claims are also in condition for allowance.

V. Conclusion

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication of which is respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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